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| 10/589,421 | 08/15/2006 | Masahide Miura | 129097 | 9868 |
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| EXAMINER FORREST, MICHAEL | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,421

Applicant(s)

MIURA, MASAHIRO

Examiner

MICHAEL FORREST

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-10 is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1 and 3-10 are pending in this application. Applicant has amended claim 1, canceled claim 2, and added claims 8-10.

Response to Arguments

Applicant's arguments, see REMARKS, filed 12/17/2008, with respect to 7 have been fully considered and are persuasive. The rejection of claim 7 has been withdrawn.

Applicant's arguments, see REMARKS, filed 12/17/2008, with respect to the rejection(s) of claim(s) 2-3 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Morikawa(US Patent Application Publication 2002/0049137) in further view of Kuno(Japanese Application Publication 2003-277060).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa(US Patent Application Publication 2002/0049137) in further view of Kuno(Japanese Application Publication 2003-277060).

Morikawa teaches:

(1) A catalyst comprising a metal oxide secondary particle comprising an agglomeration of a plurality of primary particles (see Para 0047-0048).

(2) A catalyst where the agglomeration has different distributions of metal element between the surface and inner portion (see Para 0049).

(3) A catalyst wherein Rh is supported on the secondary particles (see Para 0057).

(4) A secondary particle wherein CeO₂ is distributed more in the inner portion of the secondary particle and ZrO₂ is distributed more in the surface side of the secondary particle (see Para 0072 to Para 0074 and Example 20)

Morikawa does not specifically teach a catalyst where the secondary particle has molar fraction of 35 to 50 mol% cerium based on the total molar number of cerium and zirconium in said secondary particle.

Kuno '060 teaches a catalyst comprising a metal oxide particle wherein the particle comprises a ceria-zirconia compound oxide that contains mainly CeO₂ as nuclei and mainly ZrO₂ present around the nuclei (see Detailed Description, Para 0011). Kuno '060 further teaches a catalyst where the particles support rhodium (see Detailed Description, Para 0018). Kuno '060 further teaches that the molar ratio of Ce/Zr is preferably from 3/7 to 7/3. Kuno '060 further teaches a specific catalyst in example where the mass ratio of CeO₂/ZrO₂ is 58/38 or about 52 mol%.

Both catalysts of the prior art are composite oxide particles comprising Ce and Zr that are used for purification of exhaust gases. It would have been obvious to one of ordinary skill in the art at the time of the invention to produce the catalyst as taught by Morikawa with a molar ratio of Ce/Zr of 30 to 70% as taught by Kuno because adjusting

the molar ratio is the application of a known technique to improve a similar product taught by Kuno '060.

In a case where claimed ranges overlap or lie inside ranges disclosed by prior art a *prima facie* case of obviousness exists. Here, the claimed range of 35 to 50 mol% lies within the prior art range of 30 to 70 mol%. It would have been obvious to one of ordinary skill in the art at the time of the invention to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference.

The examiner acknowledges that applicants have provided some evidence to support the criticality of the claimed range in Figure 3 and 5. However, Figure 5 shows few data points and also appears to show that a catalyst with 50 mol% does not vary significantly from 52 mol%. According to the present specification and Table 2 (pg. 15), 25-75 mol% ceria maintains a relatively large specific surface area while providing OSC. In view that Kuno '060 teaches a range of 30-70 mol%, specifically teaches 52 mol% and the present specification suggests that 25-75 mol% are sufficient, evidence that demonstrates the significance of the claimed range with unexpected results with more specificity is necessary to overcome this rejection.

Regarding Claim 3, Kuno '060 further teaches a catalyst where the total molar fraction of cerium and zirconium is at least 85 mol% based on the total molar number of metals in said metal oxide particles (see Detailed Description, Para 0007).

Regarding Claim 4, Morikawa further teaches a catalyst where the secondary particles have average particle diameters desirably 8 μ m or less (see Para 0052).

Regarding Claim 5, Morikawa further teaches a catalyst where the yttria is mixed with ceria (see Para 0072). Morikawa also teaches a catalyst where the agglomerated particles further involve an oxide of rare-earth elements other than Y (see Para 0075).

Regarding Claim 6, Morikawa further teaches a catalyst where yttria is mixed with the zirconia (see Para 0074). Morikawa also teaches a catalyst where the agglomerated particles further involve an oxide of rare-earth elements other than Y (see Para 0075).

Allowable Subject Matter

Claims 7-10 are allowable subject matter.

The following is a statement of reasons for the indication of allowable subject matter: Instant Claim 7 discloses a method of preparing metal oxide particles by providing a suspension of ceria and zirconia where the pH is adjusted to the isoelectric point of ceria, then the pH is adjusted to the isoelectric point of zirconia. Claims 8-10 disclose further limitations which depend on Claim 7.

The closest prior art are:

Kuno(Japanese Application Publication 2003-277060) which teaches a method of preparing metal oxide particles by (1) preparing a solution of zirconia sol and ceria sol; (2) drying and calcining the mixture; and (3) a noble metal is supported (see Detailed Description, Para 0016 to Para 0018). Kuno does not teach a method where the components of the sol are precipitated by adjusting the pH.

Kuno(US Patent Application Publication 2004/0087440) which teaches a method of preparing metal oxide particles by providing a suspension of cerium oxides and zirconium oxide, adjusting the pH of the suspension to the isoelectric point of the zirconium oxide to form aggregates, and drying and firing the aggregates. Kuno '440 does not teach a 2 stage adjustment where the pH is first adjusted to the isoelectric point of ceria. Kuno '440 is also unavailable as prior art in view of the foreign priority of the instant application as perfected on 12/17/2009.

The closest prior art do not teach all of the limitations of the instant claim.

Conclusion

Claims 1 and 3-10 are pending. Claims 1 and 3-6 are rejected. Claims 7-10 are allowable

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL FORREST whose telephone number is (571)270-5833. The examiner can normally be reached on Monday - Thursday, 9:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Mayes can be reached on (571)272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M. Curtis Mayes
Supervisory Patent Examiner
Art Unit 1793

Michael Forrest
Patent Examiner
Art Unit 1793

/Michael Forrest/
4/06/09

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793